

**REMARKS**

Applicants respectfully request reconsideration and withdrawal of the outstanding Office Action rejections based on the foregoing amendments and following remarks. Claim 1 has been amended by incorporating the subject matter of claims 4 and 15 and claims 4 and 15 have been cancelled. Claims 5, 6, 14, 16, 34, 35, 39, and 40 have been amended to correct their dependencies in accordance with the amendment to claim 1. No new matter has been added.

**Response to Rejections under 35 U.S.C. § 103**

Claims 1, 4-6, 14-20, 34, 35, and 39 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Maclaren et al. (Chemical thinning of radiata pine, 1999) in view of Hacker et al. (U.S. 2001/0031704). The Examiner asserts that Maclaren discloses the use of imazapyr for the removal of undesirable *Pinus* tree species, specifically radiata pine. The Examiner acknowledges that Maclaren does not disclose treating coniferous plants with carfentrazone, but asserts that Hacker discloses the herbicidal combination A + B where A is selected from imidazolinones such as imazapyr and B is one or more herbicides including carfentrazone.

The Examiner was not persuaded by Applicants' argument that Maclaren does not suggest the use of carfentrazone for killing pine because the Examiner asserts that because it is the combination of Maclaren et al. in view of Hacker et al. that is relied upon as rendering obvious the combination of imazapyr and carfentrazone. The Examiner asserts that since Hacker et al. discloses that combining carfentrazone with

imazapyr is known to synergistically increase herbicidal effect, one of ordinary skill in the art would have been motivation to add carfentrazone in a method of controlling wildling pine with imazapyr. Applicants respectfully disagree because Hacker does not actually show any experimental data for the use of a combination of carfentrazone and imazapyr, and synergism is a result that can only be determined experimentally based on specific experimental conditions, i.e., amounts of each ingredient, ingredient ratios, application rates, and the results are specific to the particular plants that are tested. Similarly, Maclarens does not experiment with imazapyr or carfentrazone and therefore does not actually show any plant killing at all with either of these compounds. Accordingly, Applicants submit that there is no way to obviously know of or expect synergism when combining these two untested compounds for use in killing coniferous plants, which are not even mentioned in Hacker. There is nothing in Maclarens that suggests to one of ordinary skill that the combination of carfentrazone and imazapyr would be synergistic when used to kill coniferous plants.

The Examiner found the argument that the combination of references is improper unconvincing because the Examiner contends that Maclarens does not teach applying imazapyr via the hack and squirt method. Applicants completely agree that Maclarens does not teach applying imazapyr via the hack and squirt method. In fact, Maclarens does not disclose applying imazapyr at all. The application methods (for metsulfuron and glyphosate gel) mentioned in Maclarens include the hack and squirt, the Sylvaxe Hypo Hatchet, and EZJECT lance methods. Each of these techniques requires individual treatment of each tree, is tedious, time-consuming, requires special equipment, and is therefore costly. Thus, one of ordinary skill in the art would not

expect that based on the negative results in Maclareen, even when using such an invasive poisoning technique, that a much more superficial technique such as spraying the leaves of rice weeds, as disclosed in Hacker, would be at all effective in killing coniferous plants. Accordingly, Applicants submit that the combination of Hacker and Maclareen is improper.

Furthermore, the Examiner was not persuaded by Applicants' argument that Hacker and Maclareen fail to show experimental data for the use of the combination of imazapyr and carfentrazone because the Examiner asserts that Hacker **suggests** that the combination of the herbicides result in synergistically increased effects. Applicants respectfully submit that a **suggestion, with no experimental evidence**, that the combination of imazapyr and carfentrazone may have synergistic effects in controlling rice weeds in no way renders obvious, with a reasonable expectation of success, that a synergistic combination of imazapyr and carfentrazone will have synergistic effects in controlling coniferous plants.

The Examiner contends that the data submitted by the Applicants in the specification Tables 1-3 fails to show control results for carfentrazone used alone. Hence, the Examiner asserts that it is impossible to know if carfentrazone alone increases herbicidal effect or if it is the combination of imazapyr and carfentrazone that provides a synergistic effect, which would be an unexpected result and perhaps unobvious to the person of ordinary skill in the art. Applicants respectfully disagree because the combined action of the imidazolinone herbicide A and herbicide B provide

increased control of coniferous plants in comparison with solo application of imidazolinone herbicides and solo application of herbicide B. In particular, Tables 1 and 3 of the specification clearly show that imidazolinone herbicides such as imazapyr provide no or only slight control (0-10%) of pine species, while combinations of imidazolinone herbicides with carfentrazone (herbicide B) provide very high control.

TABLE 1

Treatment	Rate kg active/ha*	Loblolly Pine % control**
Control	—	0
Imazapyr	0.56	0
Imazapyr + Carfentrazone	0.56 + 0.45	84

\*means of four replications

TABLE 3

Treatment	Rate kg active/ha	Loblolly Pine % control*
Control	—	0
Imazapyr	0.56	10
Imazapyr + Carfentrazone	0.56 + 0.220	80
Imazapyr + Glyphosate	0.56 + 4.5	60

\*means of three replications, ratings at 82 days after treatment

Furthermore, the control achieved by combined application of imidazolinones with carfentrazone is significantly higher than the control achieved by carfentrazone alone as demonstrated by the results presented in tables 2, 2a and 3 of Mr. Zawierucha's declaration filed on May 29, 2009 (reproduced below). As is clear from the data in the following tables, when carfentrazone alone is applied at a rate of 0.066 kg active/ha for 225 days, the percent control of loblolly pine is only 40%. However, when imazapyr (0.56 kg active/ha) is combined with 0.066 kg active/ha carfentrazone, the percent control is 80% (after 225 days- see Table 2a below). Applying Colby's formula to determine the expected percent control of the combination of imazapyr (A) from Table 1 or 3 of the specification (above), it is clear that synergism has been demonstrated.

$$\begin{aligned} \text{Exp} &= (A + B) - (A * B) / 100 = (0 + 40) - (0 * 40) / 100 = 40\%. \\ \text{Exp} &= (A + B) - (A * B) / 100 = (10 + 40) - (10 * 40) / 100 = 46\%. \end{aligned}$$

Thus, because the observed percent control of loblolly pine using the combination of imazapyr (0.56 kg active/ha) with 0.066 kg active/ha carfentrazone is **80%**, synergism has been demonstrated.

Applying the same calculation to the increased amount of carfentrazone (0.133) the calculations are as follows:

$$\text{Exp} = (A + B) - (A * B) / 100 = (0 + 82) - (0 * 82) / 100 = 82\%.$$
$$\text{Exp} = (A + B) - (A * B) / 100 = (10 + 82) - (10 * 82) / 100 = 83.8\%.$$

Thus, because the observed percent control of loblolly pine using the combination of imazapyr (0.56 kg active/ha) with 0.133 kg active/ha carfentrazone is **93%** (after 225 days- see Table 2a below), synergism has been demonstrated.

Table 2.

Treatment	Rate	Loblolly Pine
	kg active/ha	% control*
Control	--	0
Imazapyr + Carfentrazone	0.56 + 0.066	77
Imazapyr + Carfentrazone	0.56 + 0.133	92
Imazapyr + Flumioxazin <sup>+</sup>	0.56 + 0.286	60
Imazapyr + Pyraflufen <sup>+</sup>	0.56 + 0.280	65

\* means of three replications, ratings at 69 days after treatment

+ comparative

Table 2a.

Treatment	Rate	Loblolly Pine
	kg active/ha	% control*
Control	---	0
Imazapyr + Carfentrazone	0.56 + 0.066	80
Imazapyr + Carfentrazone	0.56 + 0.133	93
Imazapyr + Flumioxazin <sup>+</sup>	0.56 + 0.286	63
Imazapyr + Pyraflufen <sup>+</sup>	0.56 + 0.280	50

\* means of three replications, ratings at 225 days after treatment

+ comparative

Table 3.

Treatment	Rate (kg active/ha)	Loblolly Pine	
		(% control)*	
		46 DAT	225 DAT
Control	---	0	0
Carfentrazone	0.066	38	40
Carfentrazone	0.133	55	82
Glyphosate	1.68	48	98
Carfentrazone + Glyphosate	0.066+1.68	93	99

\* means of 3 replications, ratings @ 46 DAT or 225 DAT

Accordingly, based on the above, Applicants submit that a synergistic effect has clearly been demonstrated, which is an unexpected result and would have been unobvious to the person of ordinary skill in the art.

In view of the above, Applicants submit that the present claims are not rendered obvious by the purported combination of the cited art because clear and convincing experimental evidence of synergism have been provided demonstrating an unexpected result. Alternatively, Applicants maintain that the combination of the cited art is improper because a person skilled in the art would not combine Hacker and McLaren for the above reasons. Accordingly, Applicants respectfully request that the rejections be withdrawn and the claims be allowed.

### Conclusions

In view of the above amendments and remarks hereto, Applicants believe that all of the Examiner's rejections set forth in the April 29, 2010 Office Action have been fully overcome and that the present claims fully satisfy the patent statutes. Applicants, therefore, believe that the application is in condition for allowance.

The Director is authorized to charge any fees or overpayment to Deposit Account No. 02-2135.

The Examiner is invited to telephone the undersigned if it is deemed to expedite allowance of the application.

Respectfully submitted,

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